REMARKS

Claims 19 - 21, 24 and 30 have been amended, and claim 31 has been added in order to more particularly point out, and distinctly claim the subject matter to which the applicants regard as their invention. It is believed that this Amendment is fully responsive to the Office Action dated February 26, 2003.

The Examiner maintains the following rejections in the outstanding final Action:

(1) claims 21 - 30 stand rejected under 35 USC §102(e) as being anticipated by Tabersky (U.S. Patent No. 5,981,078);

(2) claims 19, 21 and 22 - 30 stand rejected under 35 USC §102(e) as being anticipated by Kukino (U.S. Patent No. 5,700,551);

(3) claims 21 - 30 stand rejected under 35 USC §102(b) based on Japanese Patent Publication No. 6-17228;

(4) claims 20 - 30 stand rejected under 35 USC §102(b) as being anticipated by German Patent Publication No. 43 17 758; and

(5) claims 19 and 22 - 30 stand rejected under 35 USC §102(b) as being anticipated by Japanese Patent Publication No. 55 120936 or "Nissin Electric (Abstract of JP 05250770)."

The applicants respectfully request reconsideration of these rejections.

First, in Tabersky, the hard metal-carbonitride layer is taught to have a lattice constant within the range of "0.430 - 0.455" or "0.430 - 0.450" (see, column 2, lines 51 - 54 and claim 1 of Tabersky), which is clearly out of the range "0.414 - 0.423" set forth in claim 21. Further, Tabersky's layer has a CyN_3-y ($0.2 < y < 0.9$) component. Such a carbon -containing component is not present in the hard coating recited in claim 21, as amended.

Secondly, as to Kukino, the hard composite material (ultrafine particle-layered film (1)) has a multi-layer structure consisting of unit layer (a) and unit layer (b). The ultrafine particle-layered film preferably has at least one layer made of a compound whose crystal structure is cubic system and at least one layer made of a compound whose crystal structure is not cubic system (preferably hexagonal system) and/or is amorphous (see, column 2, lines 38 - 44 in Kukino). Thus, the applicants' claimed hard coating, as recited amended claim 19 or 21, which is solely of a cubic crystalline structure, is distinguishable over the multi-layer hard coating taught in Kukino, which preferably comprises a mixture of cubic crystalline structure and a hexagonal/or amorphous structure. Further, there is no disclosure in Kukino, which would suggest that the layer of a cubic crystalline structure has the particular range of lattice constant as claimed (i.e., 0.414 to 0.423), and the particular range of hardness, as claimed.

Thirdly, JP '228 teaches a hard coating comprising a (Ti, M) N (M: Al, Hf, or Zr) layer and a (Ti, M) (CxNy) layer (where X increases from 0 to 1 from the surface of the cemented carbide base

to the surface side, with $x + y = 1$). The hard coating of JP '228 thus has a multi-layer structure and includes the carbonitride component which is not present in claim 21, as amended.

Fourth, DE '758 teaches the use of TiBN or TiZrN as a hard coating material. DE '758 is, however, completely silent as to the proportion of the respective elements. Accordingly, it is totally unclear what specific crystalline structure (type of crystalline system and lattice constant) the hard coating material has. With respect to TiBN, for example, it is unclear even whether it is of cubic system or hexagonal system (TiB is generally hexagonal while TiN is generally cubic). In other words, the specific crystalline structure as claimed in claim 20 or 21 is not inherent in the hard coating DE '758. Further, with respect to the requirement of Vickers hardness of higher than 3000, as now recited in amended claim 20, such a high hardness is obtained only when the hard coating has a face-centered cubic crystalline structure, and the crystalline size is not more than 9nm (see, page 7, lines 15 - 21 of the applicants' specification). See, also, page 4, lines 20 - 25 of the applicants' specification regarding the hardness of not less than 2500 recited in claim 21. Thus, also regarding the claimed hardness feature, it is not an inherent property of the hard coating of the reference.

Fifth, JP '936 discloses a cover layer represented by (TixCry) CN ($x + y = 1$ and $y = 0.01$ - 0.1). The applicants' claimed hard coating, as set forth in amended claim 19, is distinguishable over the cover layer, which essentially comprises the CN component.

Lastly, JP '770 is in no way relevant to claim 19 since JP '770 does not disclose the inclusion of Cr component in the deposited film. Further, according to the method taught by JP '770, the resulting deposited film comprises a mixture of BN and TiN. The TiMeN compound, as claimed in claim 22, is clearly distinguishable over such a mixture in JP '770. The applicants also respectfully submit that BN (boron nitride) is usually of a hexagonal crystal system, while TiN (titanium nitride) is usually of a cubic crystal system. That is, the deposited layer of the JP '770 has a mixed crystal system; and is thus clearly distinct from the hard coating set forth in claim 20, which is solely of a face-centered cubic crystalline structure. Moreover, like the other references, there is no teaching in JP '774, which even remotely suggests the particular crystal size and hardness, as claimed.

In view of the above, the applicants respectfully submit that not all of the claimed elements or features, as now set forth in the claims as amended, are found in exactly the same situation and united in the same way to perform the identical function in the teachings of each of the cited references. Thus, there can be no anticipation under 35 USC §102 of the applicants' claimed invention based on each of the cited references.

Accordingly, the withdrawal of the outstanding anticipation rejections under 35 USC §102 based on Tabersky (U.S. Patent No. 5,981,078), Kukino (U.S. Patent No. 5,700,551), Japanese Patent Publication No. 6-17228, German Patent Publication No. 43 17 758; Japanese Patent Publication No. 55 120936 or "Nissin Electric (Abstract of JP 05250770)" is in order, and is therefore respectfully solicited.

In view of the aforementioned amendments and accompanying remarks, claims, as amended, are in condition for allowance, which action, at an early date, is requested.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact the applicants' undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned "**Version with markings to show changes made**."

In the event that this paper is not timely filed, the applicants' respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE 09/807,436

IN THE CLAIMS:

Please amend claims 19 - 21, 24 and 30 as follows:

19. (Amended) A sliding member [comprising] consisting essentially of a substrate and a hard coating formed on said substrate, wherein said hard coating [comprises a nitride-based material containing] consists essentially of titanium nitride and Cr, [and having] has a face-centered cubic crystalline structure with a lattice constant ranging from 0.414 to 0.423 nm in a crystal of said nitride-based material and has a Vickers hardness of not less than 2500.

20. (Amended) A sliding member [comprising] consisting essentially of a substrate and a hard coating formed on said substrate, wherein said hard coating [comprises a nitride-based material containing] consists essentially of titanium nitride and B, [and having] has a face-centered cubic crystalline structure comprising crystallites of an average size of not more than 9 nm and has a Vickers hardness of higher than 3000.

21. (Amended) A sliding member [comprising] consisting essentially of a substrate and a hard coating formed on said substrate, wherein said hard coating [comprises a nitride-based material containing] consists essentially of titanium nitride and at least one element selected from the group consisting of Zr and Hf, [and having] has a face-centered cubic crystalline structure with a lattice constant ranging from 0.414 to 0.423 nm in a crystal of said nitride-based material and has a Vickers hardness of not less than 2500.

24. (Amended) A sliding mechanism [comprising] consisting essentially of a combination of a movable member and a static member, wherein either said movable member or said static member is made of a sliding member according to any of claims 19, 20 and 21, or made by a method comprising the steps of: forming a hard coating on said substrate by simultaneously depositing in a vacuum Ti and at least one element selected from the group consisting of Cr, Zr, Hf and B on said substrate while irradiating said substrate with ion beams containing substantially nitrogen ions, and the remaining member is made of a material containing carbon.

30. (Amended) A dressing tool [comprising] consisting essentially of a sliding member according to any of claims 19, 20 and 21, or comprising a sliding member made by a method comprising the steps of: forming a hard coating on said substrate by simultaneously depositing in a vacuum Ti and at least one element selected from the group consisting of Cr, Zr, Hf and B on said substrate while irradiating said substrate with ion beams containing substantially nitrogen ions.

Add claim 31 as follows:

31. (Added) A sliding member consisting essentially of a substrate and a hard coating formed on said substrate, wherein said hard coating consists essential of titanium nitride and Si, has a face-centered cubic crystalline structure comprising crystallites of an average size of not more than 9nm, and has a Vickers hardness of higher than 3000.